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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Han-Sheng Luo

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7590

10/20/2006

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EXAMINER

PARRIES, DRU M

ART UNIT

PAPER NUMBER

2836

DATE MAILED: 10/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center">Office Action Summary</p>	<p>Application No.</p> <p align="center">10/677,833</p>	<p>Applicant(s)</p> <p align="center">LUO ET AL.</p>	
	<p>Examiner</p> <p align="center">Dru M. Parries</p>	<p>Art Unit</p> <p align="center">2836</p>	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 26-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I (Claims 1-25) in the reply filed on August 4, 2006 is acknowledged. The election "without traverse" was clarified in a phone conversation with William Pelton on October 10, 2006.

Drawings

2. The drawings are objected to because Figs. 3A and 7 have a lot of misspelled words (i.e. "driver", "inverter", "compensation", among others). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 9 and 10 are objected to because of the following informalities: The Examiner believes the last word in each of those claims should be “ratios” (plural). Appropriate correction is required.

4. Claims 1 and 2 are objected to because of the following informalities: In Claim 1, the term “USP” should be changed to “UPS”, and in claim 2, line 10, the phrase “USP modules” should be changed to “inverters”. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 17 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim states, “detects a direct current (DC) voltage of the bus”, however the voltage on the bus is AC. Appropriate correction or explanation is requested.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-8 and 11-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sashida et al. (5,257,180) and Murabayashi et al. (2003/0058595). Regarding claims 1, 2 and 23,

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Sashida teaches plural supply systems each including a DC source input to an inverter device. The AC output of each inverter device is coupled to a load (4) through a bus (3) for collectively supplying a load current. He also teaches a synchronizing clock signal (8), which controls the phases of all output voltages of the inverters, and communication circuit (all wires going between inverter devices), which controls the exchange of information between the parallel supply systems, coupled among the supply systems. He teaches a current sharing circuit (406a in all inverter devices) that controls the current rate that each supply system should output and controls the unbalance of power among the supply systems to mitigate the cross current among the supply systems. Sashida fails to teach the supply systems being UPS modules. Murabayashi teaches a DC input-DC output UPS system (Fig. 30, [0423]). It would have been obvious to one of ordinary skill in the art at the time of the invention to substitute Murabayashi's UPS system into Sashida's invention to replace each DC power supply (5, 6) so that the DC power input into each inverter device is uninterruptible and therefore more reliable than the original version.

Regarding claims 3-6, Sashida teaches the synchronizing clock (8) controlling the plurality of inverters. Sashida doesn't explicitly teach the clock signal being internal to one of the parallel inverters. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to consider the synchronizing clock (8 of Fig. 1) to be inside the first inverter device (11), since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Regarding claims 7-8, Sashida teaches that all of the plural inverters share the load current equally. Regarding claims 11-14, Sashida teaches the inverters having different rating capacities and the load current being shared based on independent ratio commands given from

the current sharing network. Each inverter device comprises a switch element (103), and when open (off) the inverter is isolated from the other inverters, also each switch is operated independently to supply power to the load.

Regarding claims 15-22, Sashida teaches that the principle shown in his inventions can be actualized by software processing under the digital control, which employs a digital signal processor. Therefore, it would be inherent that Sashida teaches software for transient and static control detecting the output voltage and current of each inverter, calculating an inverter current command to control a PWM signal applied to each inverter, utilizing calculations of the unbalanced power, the phase difference, and voltage difference through the current sharing circuit, and adjusting the cross current at least once per output voltage cycle. The control gain values are also adjustable.

Regarding claims 24-25, Sashida teaches the AC output being three-phase and at least one phase being controlled to be phase locked. (Abstract; Col. 3, lines 31-38; Col. 6, lines 26-31, 41-43; Col. 7, lines 16-21, 55-58; Col. 17, lines 31-37; Col. 27, lines 57-62).

8. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sashida et al. (5,257,180) and Murabayashi et al. (2003/0058595) as applied to claims 1 and 2 above, and further in view of Green et al. (2004/0037095). Sashida and Murabayashi teach a power system as described above. However, they fail to teach parallel inverters having the same rating capacities, supplying different levels of current to the load. Green teaches a situation where identical parallel inverters share the load current with different current sharing ratios ([0017-0018]). It would have been obvious to one of ordinary skill in the art at the time of the invention to implement this method of current distribution in Sashida's invention when necessary, so that

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the power system will try to recover the output voltage during the transients by using both control loops, voltage and current.

Conclusion

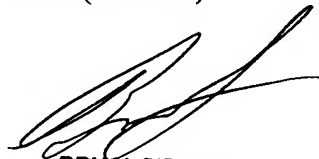
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dru M. Parries whose telephone number is (571) 272-8542. The examiner can normally be reached on Monday -Thursday from 8:00am to 5:00pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus, can be reached on 571-272-2800 x 36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DMP

10-10-2006


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